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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,324	05/09/2001	Kohei Tatsumi	1776/00057	2805

7590 06/03/2003
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EXAMINER

BEREZNY, NEAL

ART UNIT PAPER NUMBER

2823

DATE MAILED: 06/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/851,324

Applicant(s)

TATSUMI ET AL.

Examiner

Neal Berezny

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/350,125.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 2/25/03 has been considered, except for the Nikkei reference, which fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The cited Nikkei reference is not in the application file of neither the parent nor the instant applications.

Request for Information

2. Under 37 CFR 1.105, examiner requests that applicant submit a copy of the reference cited in applicant's IDS dated 2/25/03 and 5/9/01, titled "Nikkei Microdevices Publication", Japan, July 1, 1998. This reference has not been found in the parent jacket or the instant jacket. A copy of the reference is required in order for examiner to consider the reference.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 22 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa (5,955,776) in combination with Kanatake (6,178,654) and Hotchkiss (5,028,546). Ishikawa teaches building a spherical semiconductor device, fig.25, el 2502, having spherical bumps, el. 2518, on surface electrodes of a spherical semiconductor element, col.14, ln.6-8, arranging conductive balls for forming said spherical bumps, at positions corresponding to said surface electrodes, col.13, ln.67 to col.14, ln.3, the position of each of said conductive balls on said arrangement substrate is controlled to join the electrodes, col.14, ln.18-26. Ishikawa appears not to specifically teach the method steps of using an arrangement substrate and having a desired gap between the arrangement substrate and the semiconductor element. Ishikawa also appears not to specifically teach joining the conductive balls by a thermo compression bonding process.

5. Kanatake teaches the method steps of using an arrangement substrate and having a desired gap between the arrangement substrate and the semiconductor element, fig.4, col.3, ln.1-4. It would be obvious to one of ordinary skill in the art at the time of the invention to combine Kanatake with Ishikawa to form a process of forming solder balls on spherical semiconductor elements using a temporary arrangement substrate to align the spherical device for a variety of processing steps, col.2, ln.5-10, in order to connect the device to an external environment, and to form a gap in between in order to facilitate moving the sphere without damaging it.

6. Hotchkiss teaches joining solder balls to electrodes by a thermo compression process, col.2, ln.35-39. It would be obvious to one of ordinary skill in the art at the time

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of the invention to combine Hotchkiss with Ishikawa to use the well-known thermo compression process to bond the solder balls to the electrodes in order to provide an economical and efficient means of making contact with external devices.

7. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa, Kanatake, and Hotchkiss as applied to claims 22 and 26 above, and further in view of Yeh et al. (5,803,340). Ishikawa, Kanatake, and Hotchkiss appear not to specifically teach forming bumps by melting the solderballs to the electrodes, nor coating the balls with a flux. Yeh teaches forming bumps by melting the solderballs to the electrodes, and coating the balls with a flux. It would be obvious to one of ordinary skill in the art at the time of the invention to combine Yeh with Ishikawa, Kanatake, and Hotchkiss to forming bumps by the well-known method of melting the solderballs to the electrodes, in order to provide an efficient and economical means of making contact to external circuits. Further, it would be obvious to one of ordinary skill in the art at the time of the invention to also combine Yeh with Ishikawa, Kanatake, and Hotchkiss to coat the balls with a flux to reduce oxidation of the solder during the bonding process.

Response to Arguments

8. Applicant's arguments filed 2/25/03 have been fully considered but they are not persuasive. Applicant argues that a copy of a reference need not be submitted, if the reference was submitted in a previous parent application. Applicant then provides a signed IDS from the parent and a copy of the face of the parent's issued patent as

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evidence of applicant's submission of the reference in the parent application.

Applicant's reasoning is flawed because there is a presumption that if a reference was submitted in the parent, it will never get lost and never need to be replaced. Further, applicant presumes that if an examiner signs an IDS, then the reference was submitted and is still in the jacket. In the instant case, that is obviously an erroneous presumption. It is irrelevant as to whose fault it is that the cited reference is not in the parent jacket. The relevant issue is that the instant examiner **must** obtain a copy of the reference in order to properly consider it. Otherwise, would applicant suggest that the examiner sign off on the reference without actually considering the reference because the examiner could not get the cited reference and applicant refused to provide a second copy? Such reasoning only propagates the error. Examiner will not consider the cited reference until the examiner has a copy of the reference made available and placed in the jacket.

9. Applicant also anticipates the use of Hotchkiss and Yeh in rejecting the newly filed claims and argues that Hotchkiss differs from the new claims because Hotchkiss uses a plate member, whereas the claims use a spherical member. Further, applicant argues that Yeh uses paste solder bumps, whereas applicant's claims call for solid conductive balls. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The rejection uses Hotchkiss to teach thermo compression bonding, and Yeh is used to teach the use of flux and the process of melting.

CONCLUSION

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neal Berezny whose telephone number is (703) 305-1481. The examiner can normally be reached on M-F 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

NB

May 19, 2003



Olik Chaudhuri
Supervisory Patent Examiner
Technology Center 2800